

Gene name: O1-180

cDNA sequence: 1276 bp

“AAGGCGGGCGAGGCGCGGGACGCACCCATGTTCCCGGGCGAG
CACGTTCCACCCCTGCCCGCATCCTTATCCGCAGGCCACCAAAGCCGGGGATG
GCTGGAGGTTCGGAGCCAGGGCTGCCGACCCCGGCCCTCCCTCCTCCCC
GGCTACAGACAGCTCATGGCCCGGGAGTACGTCGACAGCCACCAAGCGGGCAC
AGCTCATGGCCCTGCTGTCGCGGATGGGTCCCCGGTCGGTCAGCAGGCCGTGA
CGCTCGGGTGCAGGTGAACCCCGGCCCGACGCCCTCGGTGCAGTGTCACTC
GGGCGCCGCACGCTGCAGCCTGCAGGGTGCCGAGCCAGCCCCGACGCCCGAT
CGGGTTCTGTCAACCCCGTGGCCACGCCGGGCCGGAGATCCCCGCGATC
CTGGCAGACCGTAGCCCCGTTCTCGTCCGTGACCTTCTGTGGCCTCTCCTCCTC
ACTGGAGGTTGCGGGAGGCAGGCAGACACCCACGAAGGGAGAGGGGAGCCC
GGCATCCTCGGGGACCCGGGAACCGGAGGCCGAGAGAGGGTGGCCCGAGGAA
AGCGGTCCCCCAGCCCGAAGCGAGGAGGGCGATGTTCAAGGCTGCAGGGCA
GGCCGGGTGGGAGCAGCAGCCACCAACCGAGGACCGAACAGTGTGGCGGC
GATGCAGTCTGAGCCTGGAGCGAGGAGGCCATGTCCTGCCGCAGAGATGGCT
CAGGACCCCGGTGATTGGATGCCCTCGAGACCAAGGCCCTCCCCGCAAAGCAC
GGAGCAGGACAAGGAGCGCCTCGTTCCAGTTAGAGCAGAAGTACGGCT
ACTATCACTGCAAGGACTGCAAATCCGGTGGAGAGGCCATGTCCTGCCGCAGAGATGGCT
GTGCAGGGCACCAAGGTGTTACTTCAAACAGTTCTGCCAGTGTGAGAA
ATCCTACAACCCTTACAGAGTGGAGGACATCACCTGTCAAAGTTGAAAAGAAC
TAGATGTGCTGCCAGTCAGATTGCCACGTGGACCCCTAACGCCCTAC
GGCAAGACTTGTGTGGAGATGCAAGGACAAACGCCCTGCCGCAGCAC
CTTCAGCTTCAAATACATCATTAGTGGAGAGTCGAAAACGTTCTGCTAGATGG
GGCTAATGGAATGGACAAGTGGCTTCTCCCTCTTACCTCTCCCTTCAA
ATTCTTCATGACAGACAGTGGTACTTGGATATAAAGCCTGTGAATAAAAGGTAT
TGCAAACAAAAAA

Figure 1

Amino Acid sequence: 361aa

"MFPASTFHPCPHYPQATKAGDGWRFGARGCRPAPPSFLPGYRQLMAAEYVDS
HQRAQLMALLSRMGRPSVSSRDAAVQVNPRRDASVQCSLGRRTLQPGCRASPDA
RSGSCQPRGHAGAGRSPRSWQTVAAPFSSVTFCGLSSLEVAGGRQTPTKGEGSPA
SSGTREPEPREVAARKAVPQPRSEEGDVQAAGQAGWEQQPPPDRNSVAAMQSEP
GSEEPCPAAEMAQDPGDSDAPRDQASPQSTEQDKERLRFQFLEQKYGYYHCKDCK
IRWESAYVWCVQGTSKVYFKQFCRVCEKSYNPYRVEDITCQSCKRTACPVRF
HVDPKRPHRQDLCGRCKDKRLSCDSTFSFKYII"

Figure 2

O1-184 cDNA sequence: 1817bp

GTCACAGCTTCCCTGCCGAATATGGTGATCTGTCTCCATTGTCCAGATCA
 GGATGATTCTTAGAAGAAGTCACAGAGGAATGCTATTCCCCACCCACCCCTC
 CAGAACCTGGCAATTAGAGTCTACTGAGGGATGAGGCCTGGCCATTCTG
 CTCTCACGGACCTGCCAGAGTCTGTTCCAGTAATTGTAGGGAGGCCTTC
 ACTGATGGATATATAGGGATCTTGAAGGCCATGATACTGTGTGGCCCTCCC
 ATACCTTCTTAGGAAAGCAGATAAATAATTGCAACCTGGAGACTTTGAAG
 GCTATGCTTGAGGGACTAGATATACTGCTGCACAAAAGGTTCAAACCAAGTA
 GGTGCAAACACTCAGAGTAATTAAATTGGAGAGAAGATGACTTGAAGATATGGGC
 TGGATCCCATTGAAGGTGAAGGCCTTACAGATTTCAGGACAGAGAAGCAGCCA
 ATTGAGAACAGTGCTGGCTGTGAGGTGAAGAAAGAATTGAAGGTGACGACT
 GAAGTCCTTCGCATGAAGGGCAGACTTGATGAATCTACCACATACTTGTGC
 AGTGGGCCAGCAGAGAAAAGATTCTATTCATCTATTCTGTAGAAAGCTACT
 AATTGAAGGCTTAACCAAAGCCTCAGTGATAGAAATCTCAAAACTGTACAC
 GCAGACTGTATACAGGAGCTTATCCTAAGATGTATCTGCATAGAAGAGTTGG
 CTTTCTTAATCCCTACCTGAAACTGATGAAAAGTCTTTCACACTCACACTA
 GATCACATCATAGGTACCTTCAGTTGGGTGATTCTGAAAAGCTTGATGAGG
 AGACAATATTAGCTGATTCTCAACTTCCCACACTCCACTGTCTCCAGAAA
 CTCTATGTAATGATGTCCTTTATAAAAGGCAACCTGAAAGAATACCTCAG
 GTGCCTGAAAAAGCCCTGGAGACACITTCGCATCAGTAACGTGACCTCTCAC
 AGTCAGACTGGATTGCCTGCCCTATTGCCTGAATATTGTGAACCTCAAACAT
 CTGCATATTAGTGTATATATTATGTGATTACTCCTTGAGCCTTGGTTTT
 CTCCCTGAGAGAGTTGGAGATACCCCTGAAAACCTGGAATTGGATTCATGTT
 GTATAGTGGACTTCAGTTCACTGCCTGCTGCCCTAAGCCAATGTTCT
 CACCTCAGAGAGGTCACTTCTATGATAATGATGTTCTGCCTTCTGAA
 AACAACTCTACACCACACAGCCCTGCTGAGTCAGCTGATCTGAGTGTAC
 CCTGCCCTCTAGAGTGCTATGATGACAGTGGTGTAACTAACACACAGATT
 AGAAAGTTTGTCCCTGAGCTCTGGATATACTGAGAGCCAAAAGACAGCTC
 CATACTGTCTCCTTCAAACAAACCAATGCTCTAAATGTGGTGGGTGCTACAT
 TTATGATCGGCATAACCAATGTTGCCGTTGTGGAACACTATAAGCTTGAT
 TGTGAAACTGAGAAATAGAAACTTAGTATTGGGGACTGATGAAATCCTAAGT
 GAATGTCACTGCTAAATGGAGCATGAAAATGTCAATCACCTAAAGTCTGA
 GATACACAGGAAAGTCAATAACTCCTCTGAGCTGGTGAATGGATGTTGCAT
 CTGTAGAAAGTATCAAGCACTGTAGTTGAATGTGTTACAATAGAACACC
 ATTTATGAGACTGGCCAATCTGTTGACTGCATACAATAATCTGTTGACTT
 ATTAAATTTAAAAAAAAAAAAAAAAAAAAA

Figure 3

O1-184 amino acid sequence: 426 amino acids

MVICLHCPDQDDSLEEVTEECYSPPQLQNLAIQSLLRDEALALISALTDLPQLFP
VIFEEAFTDGYIGILKAMIPVWPFPYLSLGKQINNCNLETLKAMLEGLDILLAQKV
QTSRCKLRVINWREDDLKIWAGSHEGEGLPDFRTEKQPIENSAGCEVKKELKV
TTEVLRMKGRLDESTTYLLQWAQQRKDSIHLFCRKLLIEGLTKASVIEIFKTVHA
DCIQELILRCICIEELAFLNPYLKLMKSLFTLTLTDHIIGTFSLGDSEKLDDEETIFSLIS
QLPTLHCLQKLYVNDVPFIKGNLKEYLRCLKKPLETLCISNCDSLQSDDCLPYC
LNICELKHLHISDIYLCDLLEPLGFLLERVGDTLKTLELDSCCIVDFQFSALLPAL
SQCSHLREVTFYDNDVSLPFLKTTSTPHSPAESADL

Figure 4

Gene name: O1-236

cDNA sequence: 1019bp

“GCCATATTGAGGACCTGCAGTAGAGGTGGAACCATGACTGGCAGCGCAAAC
ACAGTGATAACAGCTGAGCTCCAAGCAAGGACCCAGGACCTGCCTACCA
GACATAATCTTCCCCACAACACCTCCACCAAGCCGCCCTGTAAATCGACATGA
GTCGCCACAGCACCAGCAGCGTGAACGAAACACAGCAAAAAACATGCTCTGG
GGTAGTGAACCTCAATCAGGAAAAGCAGACTTGCACCTTAGAGGCCAAGGC
GAAGAAGGACAGCTGAAACTCTTGCACGACGATCTGCCTGGGGAGAAAG
CCAAAGAGGGAGGTGAACCGTGTGGAAGTCCTCTCCCAGGAAGGCAGAAAACC
ACCAATCACTATTGCTACGCTGAAGGCATCAGTCCTGCCATGGTCAGTGT
AGGTATAGAGCTTCTCCTCCAGTAACCTTCGGCTCAGGACTGGCTCAGGACC
TGTGTTCCCTCAGTGGCCTGGAATGTTATGAGACTTCCGACCTGACCTGGGAAG
ATGACGAGGAAGAGGGAGGAAGAGGGAGGAAGAGGATGAAGATGAGGATG
CAGATATATCGCTAGAGGAGATACCTGTCAAACAAGTCAAAAGGGTGGCTCCC
CAGAAGCAGATGAGCATAGCAAAGAAAAAGAAGGTGGAAAAAGAAGAGGATG
AAACAGTAGTGAGGCCAGCCCTCAGGACAAGAGTCCTGGAAAGAAGGGAGAA
ATCTACACCCAGAGCAAAGAAGCCAGTGACCAAGAAATGACCTCATCTTAGCAT
CTTCTGCGTCCAAGGCAGGATGTCCAGCAGCTGTGTTGGTGCAGGTGTCCA
GCCCCACCACCTAGTCTGAATGAAATAAGGTGGTGTGGCTGTAACCTGTAAAC
CCAGCCCTCCAGTTCCGGAGGTTTGGTGAAGAGCCCCCAGCAAGTCGCC
TAGGGCCACAATAAAATTGCATGATCAGGAAAAAAAAAAAAAAAAAAAAAA
AAAAAAAAAAA”

Figure 5

Amino Acid sequence: 207aa

“MSRHSTSSVTETTAKNMLWGSELNQEKTCTFRGQGEKKDSCKLLSTICLGEK
AKKEEVNRVEVLSQEGRKPPITIATLKASVLPMTVSGIELSPPVTFRLRTGSGPVFLSG
GLECYETSDLTWEDDEEEEEEEEDEDADISLEEIPVKQVKR VAPQKQMSIAKK
KKVEKEEDETVVRPSPQDKSPWKKEKSTPRAKKPVTKK”

Figure 6

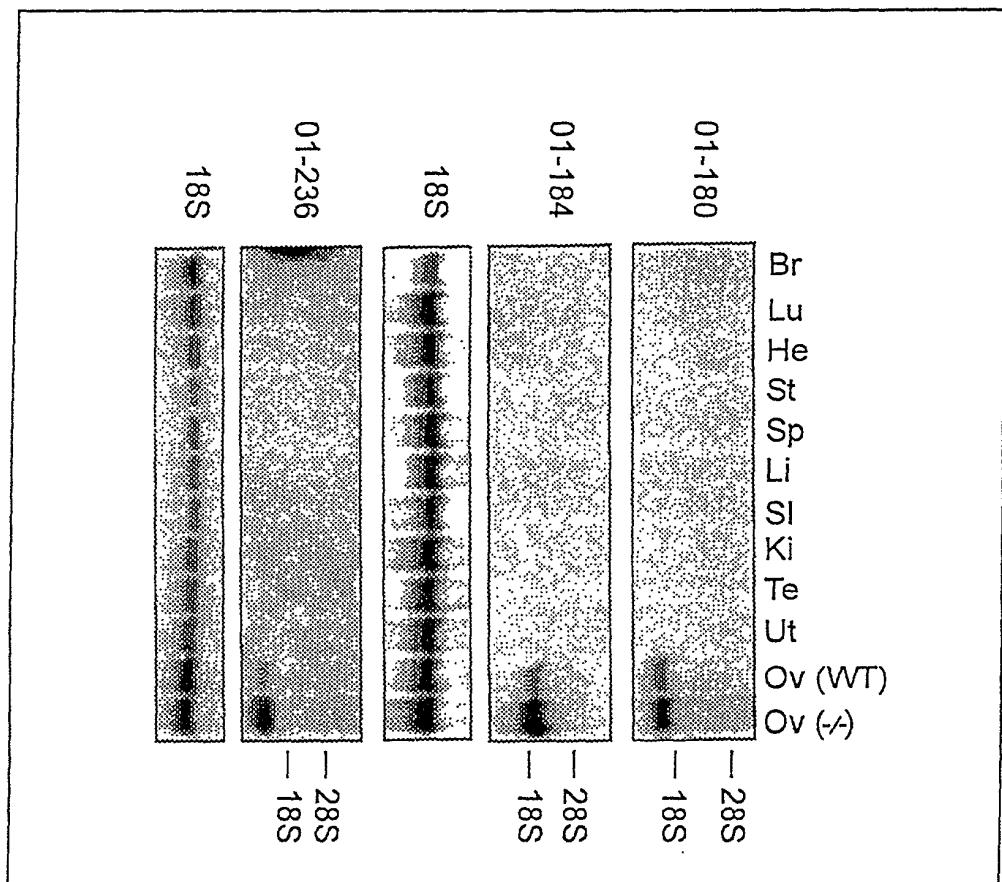


Figure 7

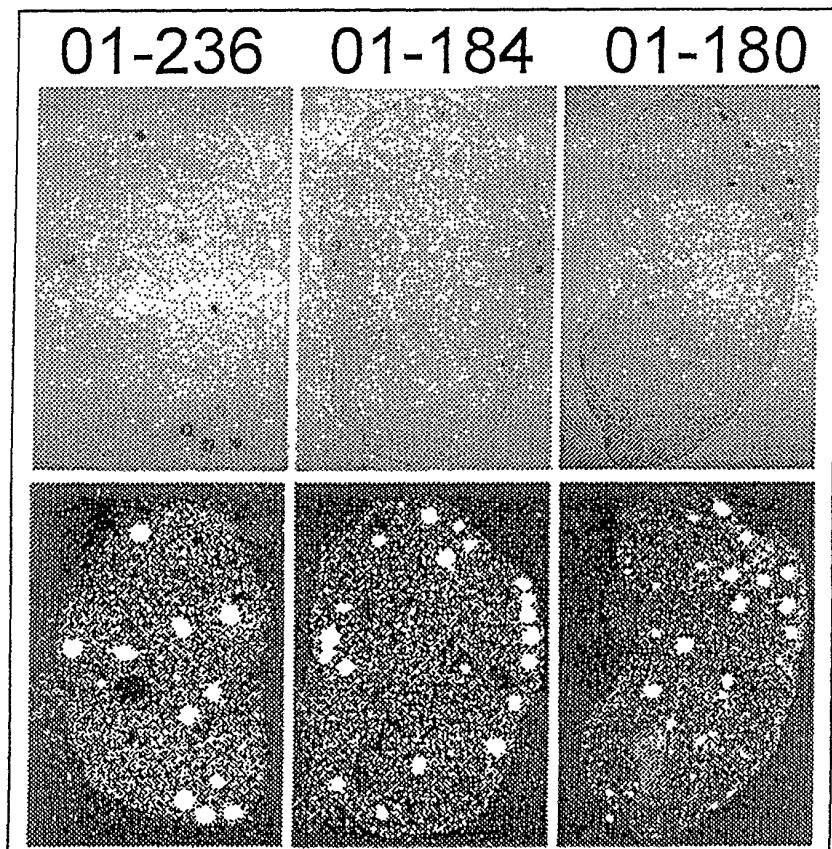


Figure 8

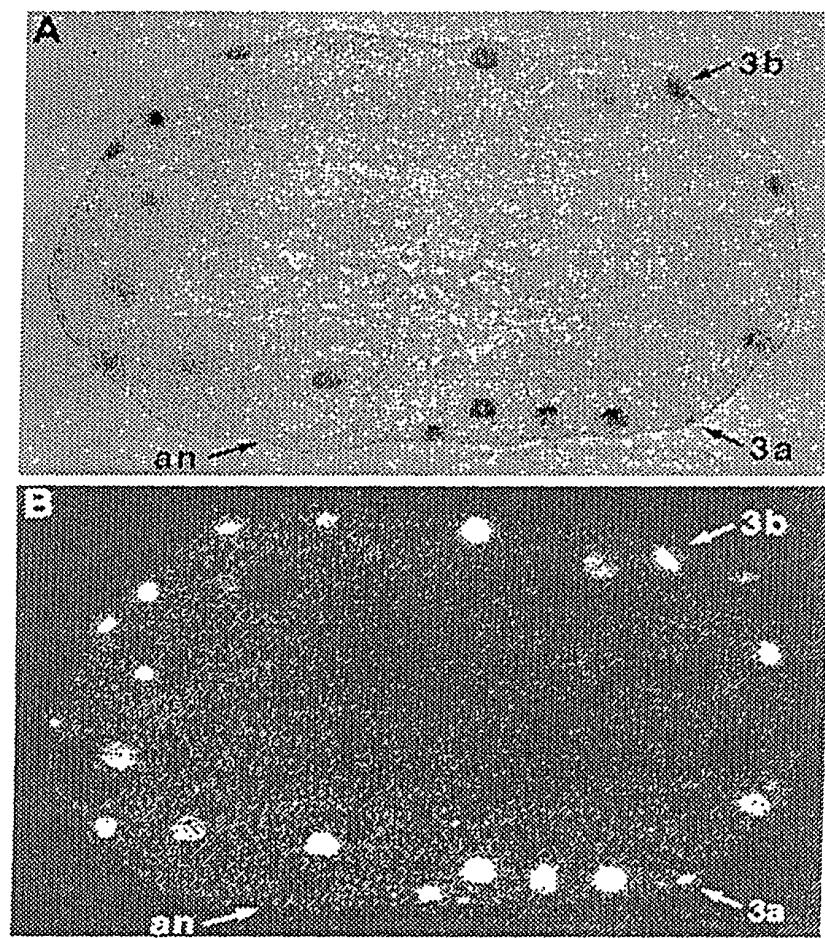


Figure 9

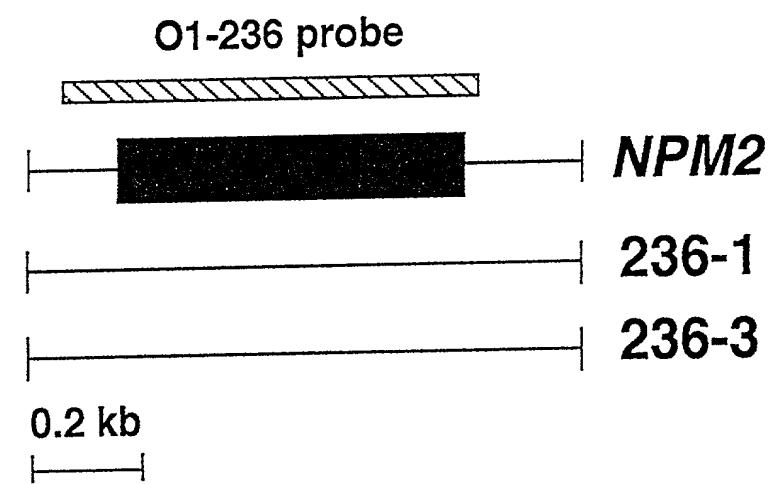


Figure 10

Npm2	MSRHSTSSVTETTAK--NMLWGSELN-QEKQTCTFRGQG-EKKDSCKLLL
	. . .
xNpm2	MA--STVSNTSKLEKPVSLIWGCSELNEQDK-TFEFKVEDDEEKCEHQALAL

PKC	CK2
96 PPV <u>T</u> FRLRTGSGPVFLSGLECYETSDLT <u>WEDDEEEEEEDEDEDAD</u>
98 PPV <u>T</u> FRLKAGSGPLYISGOHVAMEEDYSWAEEDEGEAEGEEEEEED-

196 STPRAKKPVTKK 207
189 GAGRGRKPAAKK 200

Figure 11

236-13
236-14
236-15

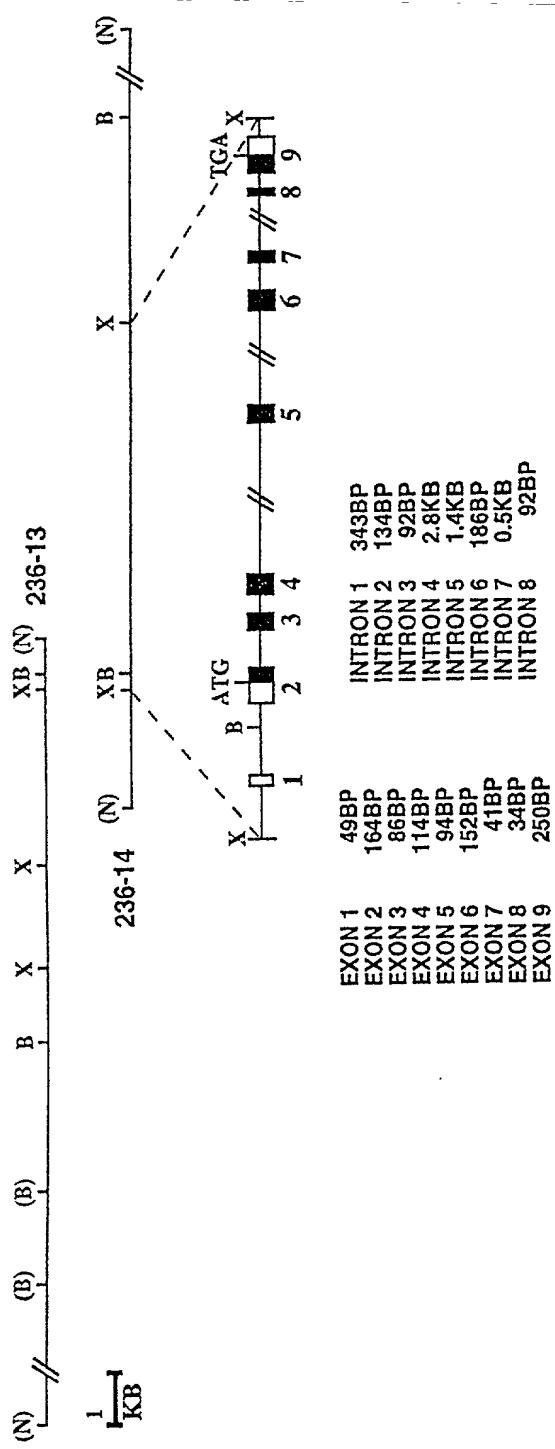


Figure 12

Mouse *Npm2* Gene Sequences

acagcagaggtgatgctcagaatcaagtttaacagagggccaggtg
 cttctagagttaggagggattgcacacctccccacccctccctttc
 ccaggctttaacagcctgtgtggaaagctgacccttagatggagc
 cctgaaGCCATATTGAGGACCTGCAGTAGAGGTGGAACCCATGACTGG
 CAGCGCAgtaagcttgcagg... intron 1= 343bp
 ...cttgcattactcgAACACAGTGATAACAGCTGAGCTCCAAGCA
 AGGACCCAGGACCTGCCTCACACAGACATAATCTTCCCCACAACA
 CCTCCACCAAGCCGCCCCTGTAAATCGAC ATG AGT CGC CAC AGC
 1 M S R H S

 6 ACC AGC AGC GTG ACC GAA ACC ACA GCA AAA AAC ATG
 T S S V T E T T A K N M

 18 CTC TGG Ggttaaggcataaggct... intron 2 = 134 bp
 L W

 20 ...gtcttcgtgtgcagGT AGT GAA CTC AAT CAG GAA AAG
 G S E L N Q E K

 28 CAG ACT TGC ACC TTT AGA GGC CAA TGC GAG AAG AAG
 Q T C T F R G Q C E K K

 40 GAC AGC TGT AAA CTC TTG CTC AGC ACGgtgggtgtctccc
 D S C K L L L S T

 49 aa... intron 3 = 92 bp ...catcaccttctcagATC
 I

 50 TGC CTG GGG GAG AAA GCC AAA GAG GAG GTG AAC CGT
 C L G E K A K E E V N R

 62 GTG GAA GTC CTC TCC CAG GAA GGC AGA AAA CCA CCA
 V E V L S Q E G R K P P

 74 ATC ACT ATT GCT ACG CTG AAG GCA TCA GTC CTG CCC
 I T I A T L K A S V L P

 86 ATGgtgagtcttctcc... intron 4 = 2.8kb ...agaa
 M

 87 gggggacacagGTC ACT GTG TCA GGT ATA GAG CTT TCT
 V T V S G I E L S

 96 CCT CCA GTA ACT TTT CGG CTC AGG ACT GGC TCA GGA
 P P V T F R L R T G S G

Figure 13A

CCT GTG TTC CTC AGT GGC CTG GAA TGT TAT Ggttaagtt
 108 P V F L S G L E C Y
 gtagccct... intron 5 = 1.35kb ...ggctacccattcc
 agAG ACT TCG GAC CTG ACC TGG GAA GAT GAC GAG GAA
 118 E T S D L T W E D D E E
 GAG GAG GAA GAG GAG GAG GAA GAG GAT GAA GAT GAG
 130 E E E E E E E D E D E
 GAT GCA GAT ATA TCG CTA GAG GAG ATA CCT GTC AAA
 142 D A D I S L E E I P V K
 CAA GTC AAA AGG GTG GCT CCC CAG AAG CAG ATG AGC
 154 Q V K R V A P Q K Q M S
 ATA GCA AAGgtggggggaaaagaa... intron 6 = 186bp
 166 I A K
 ...tggttttgttccagAAA AAG AAG GTG GAA AAA GAA
 169 K K K V E K E
 GAG GAT GAA ACA GTA GTG AGgttaattcatgcagtt...
 176 E D E T V V R
 intron 7 = 0.5kb ...ctattcccttccagG CCC AGC
 183 P S
 CCT CAG GAC AAG AGT CCC TGG AAG AAG gtgagcaataag
 185 P Q D K S P W K K
 aag... intron 8 = 92bp ...ctcttatctgcacagGAG
 194 E
 AAA TCT ACA CCC AGA GCA AAG AAG CCA GTG ACC AAG
 195 K S T P R A K K P V T K
 AAA TGA CCTCATCTTAGCATCTTCTGCGTCCAAGGCAGGATGTCCA
 207 K *
 GCAGCTGTGTTCTGGTGCAGGTGTCCAGCCCCACCACCCTAGTCTGAA
 TGTAATAAGGTGGTGTGGCTGTAACCTGTAAACCCAGCCCTCCAGTTT
 CCGGAGGTTTTGGTGAAGAGCCCCAGCAAGTTCGCCTAGGGCCACA
ATAAAATTGCATGATCAGGacccctctgcctccccctccctggat
 gggctcctcgctgcgatagctcatgtgcccagcagagggcaacc
 acgagcaagaaaccagccccatgt

Figure 13B

T31 RH Chr 14

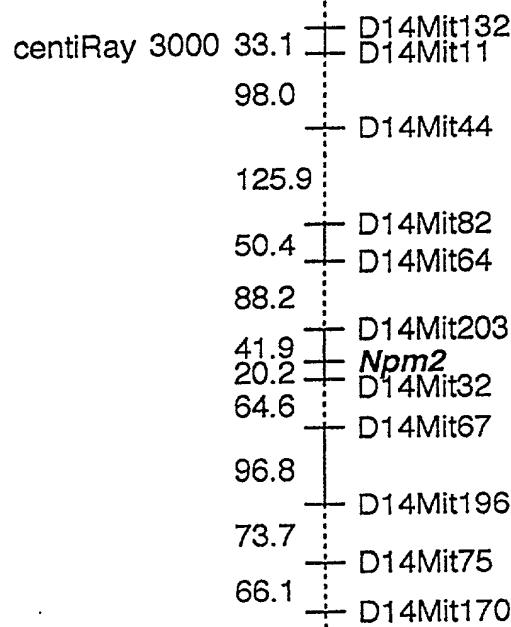
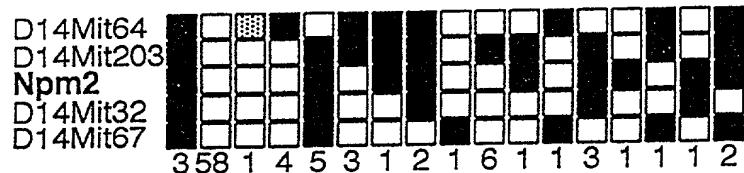
Haplotypes for T31 Chr 14 near *Npm2*

Figure 14

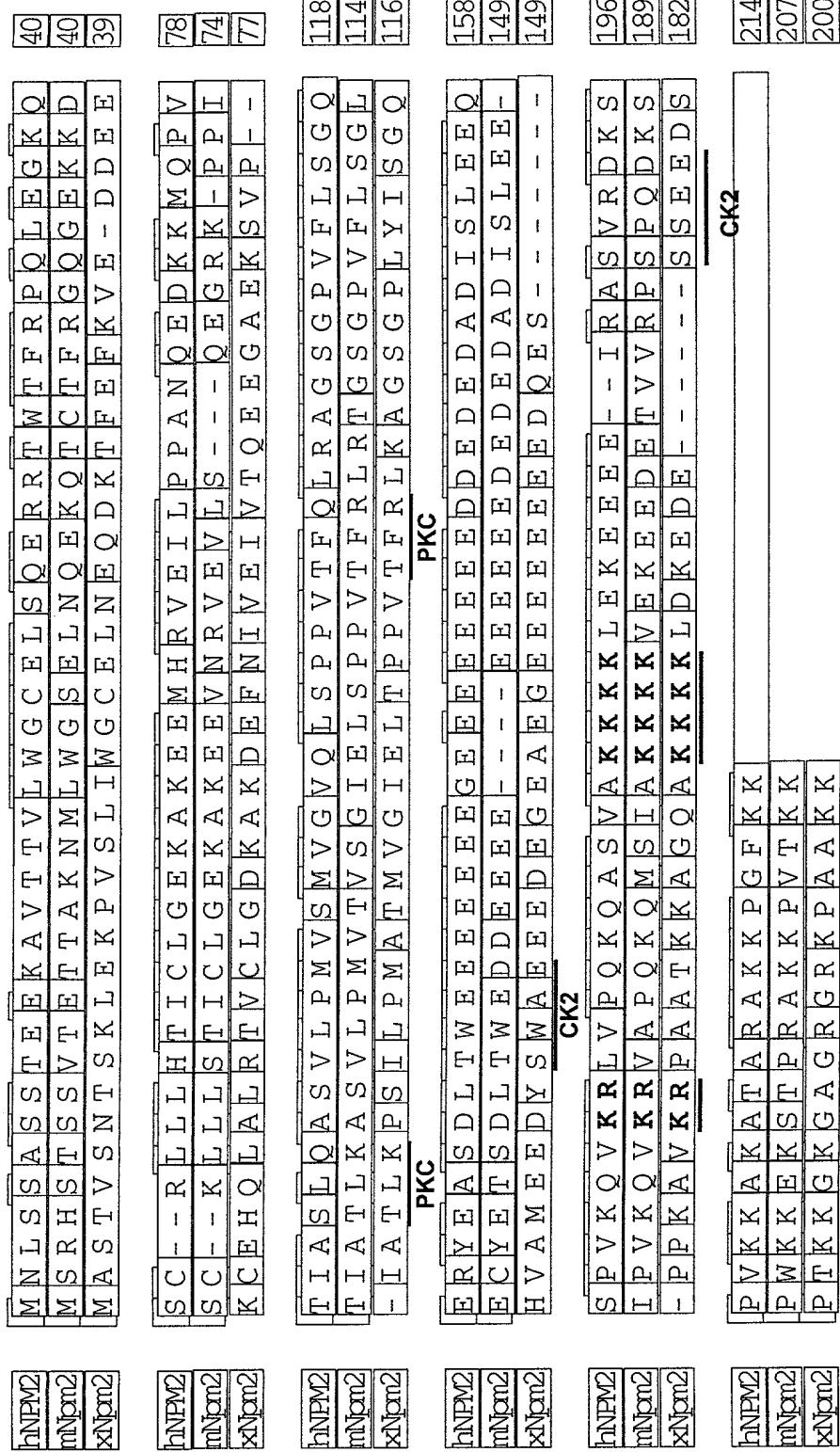


FIGURE 15

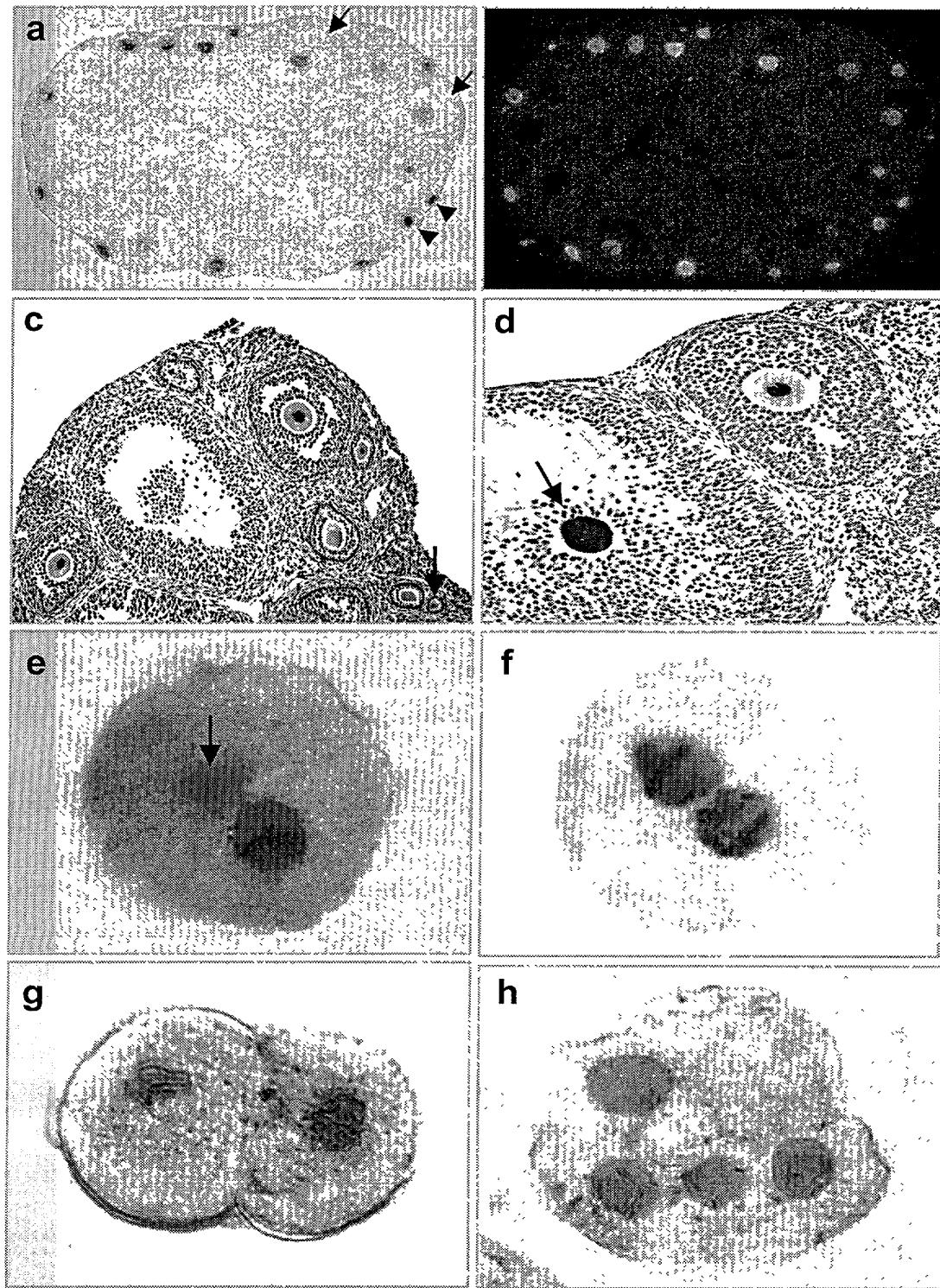


FIGURE 16

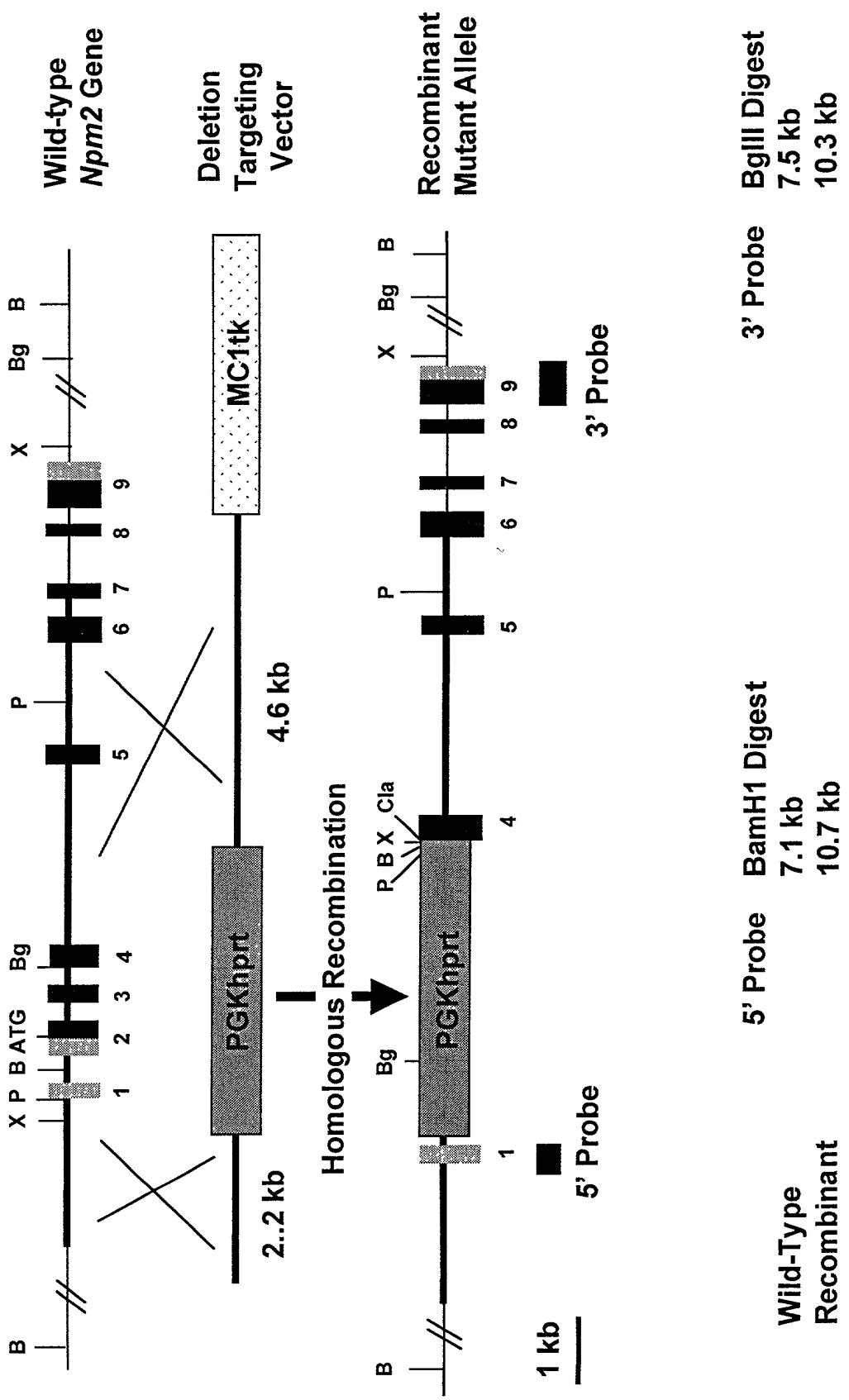


FIGURE 17a

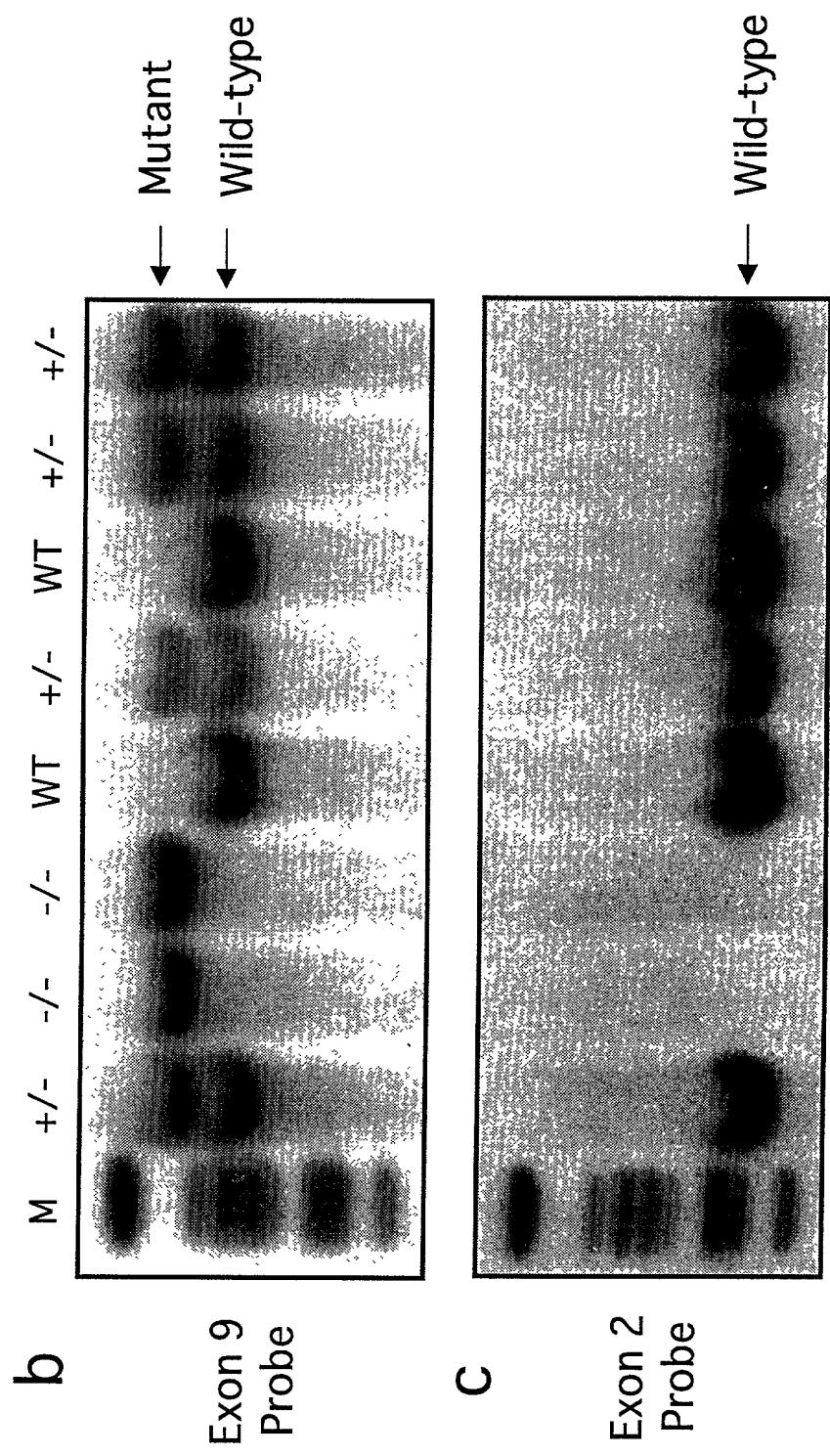


Figure 17b – Figure 17c

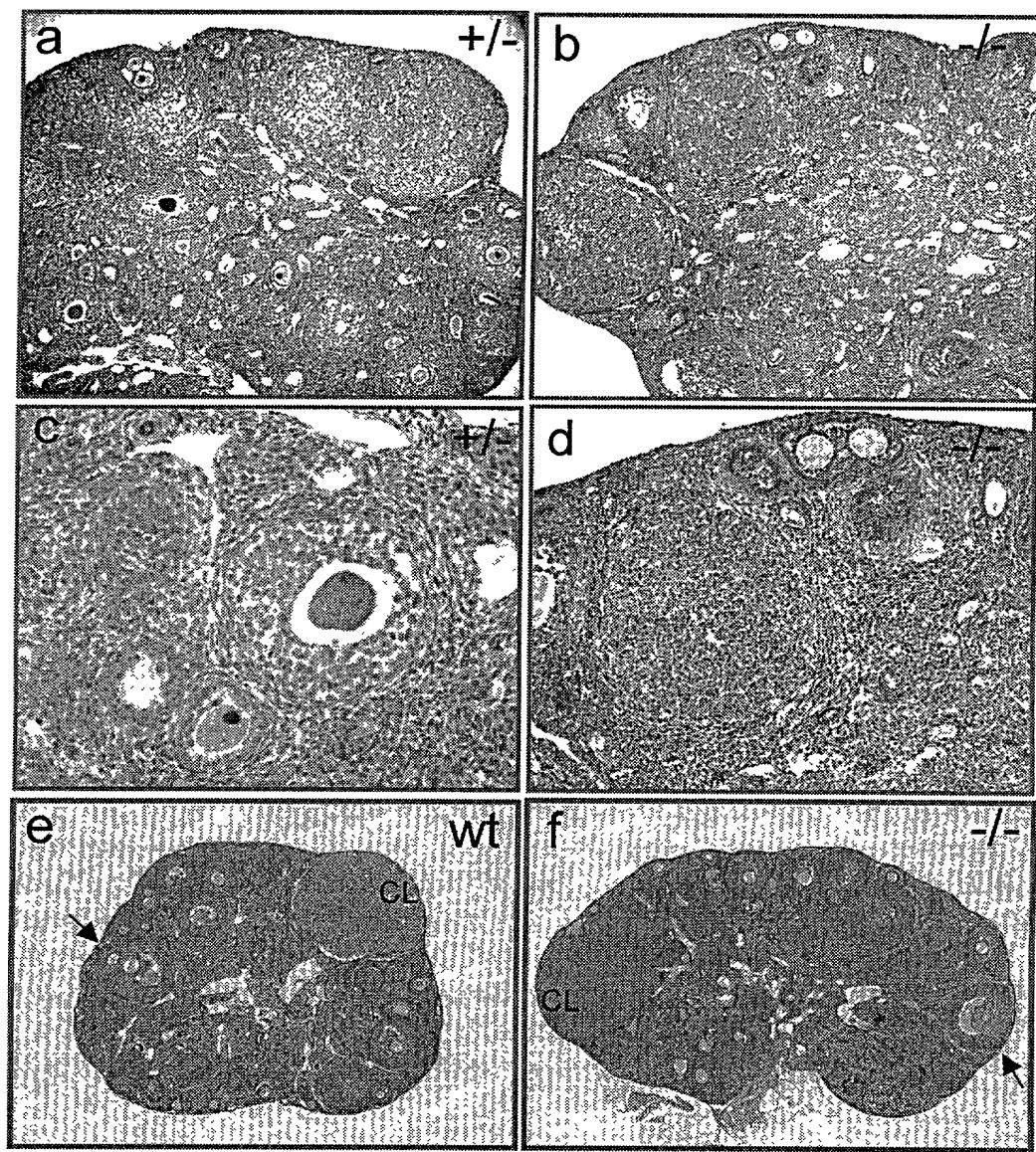


Figure 18

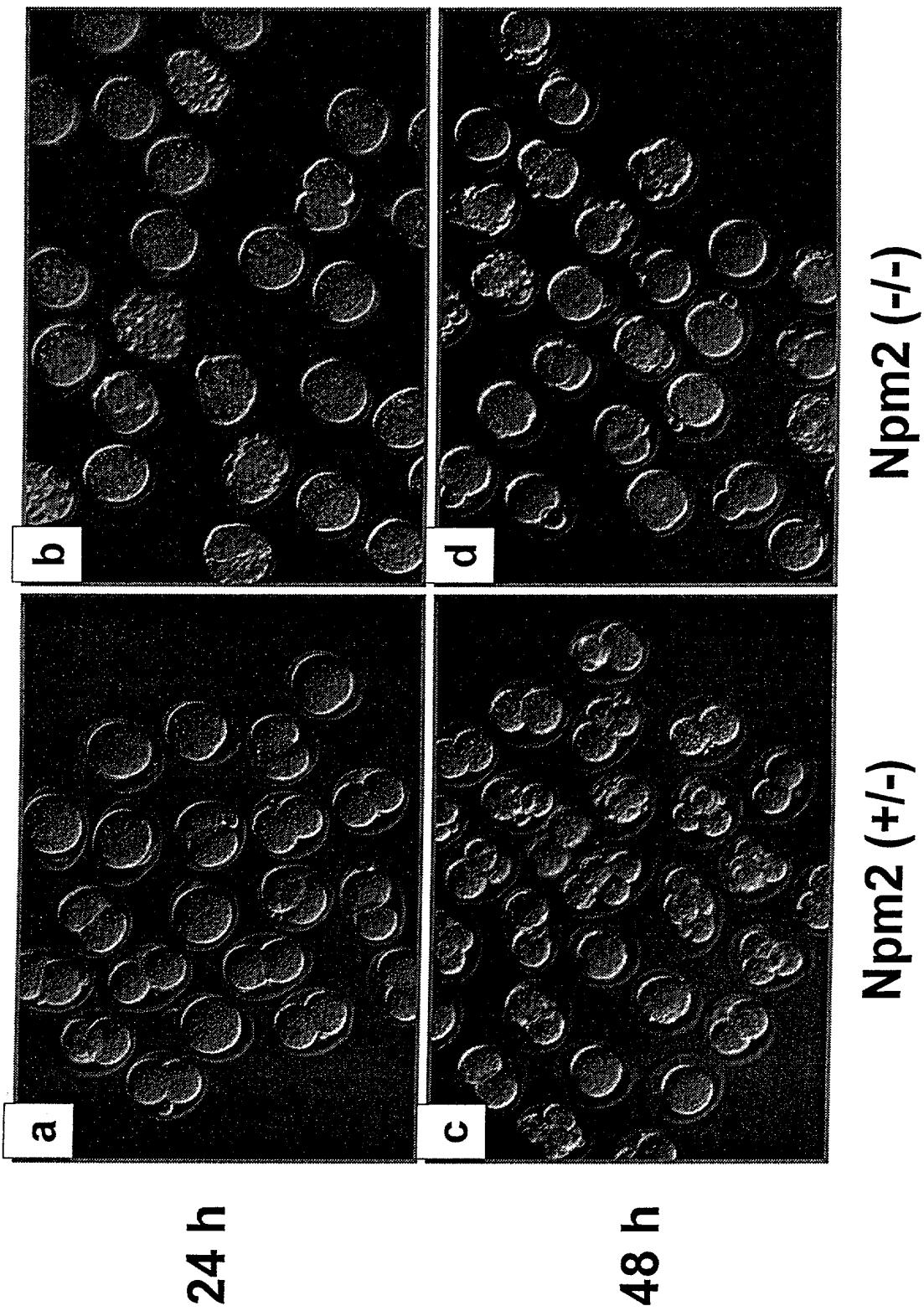


Figure 19a - 19d

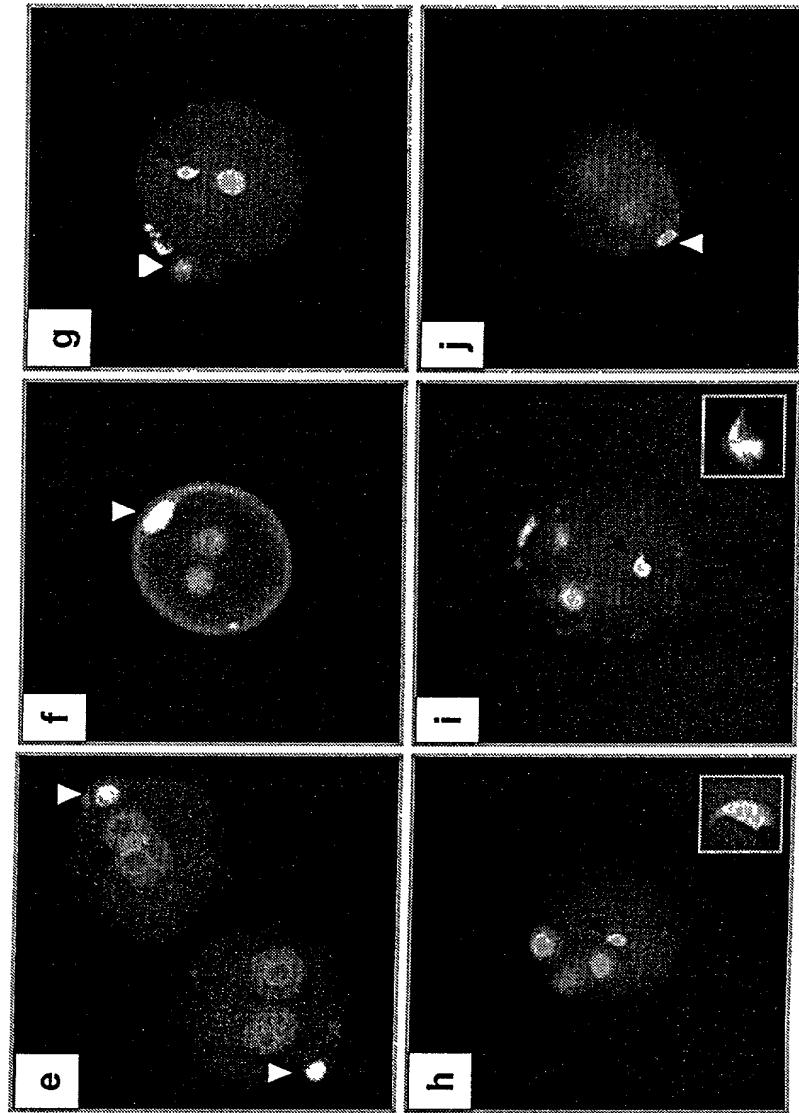


Figure 19e - 19j

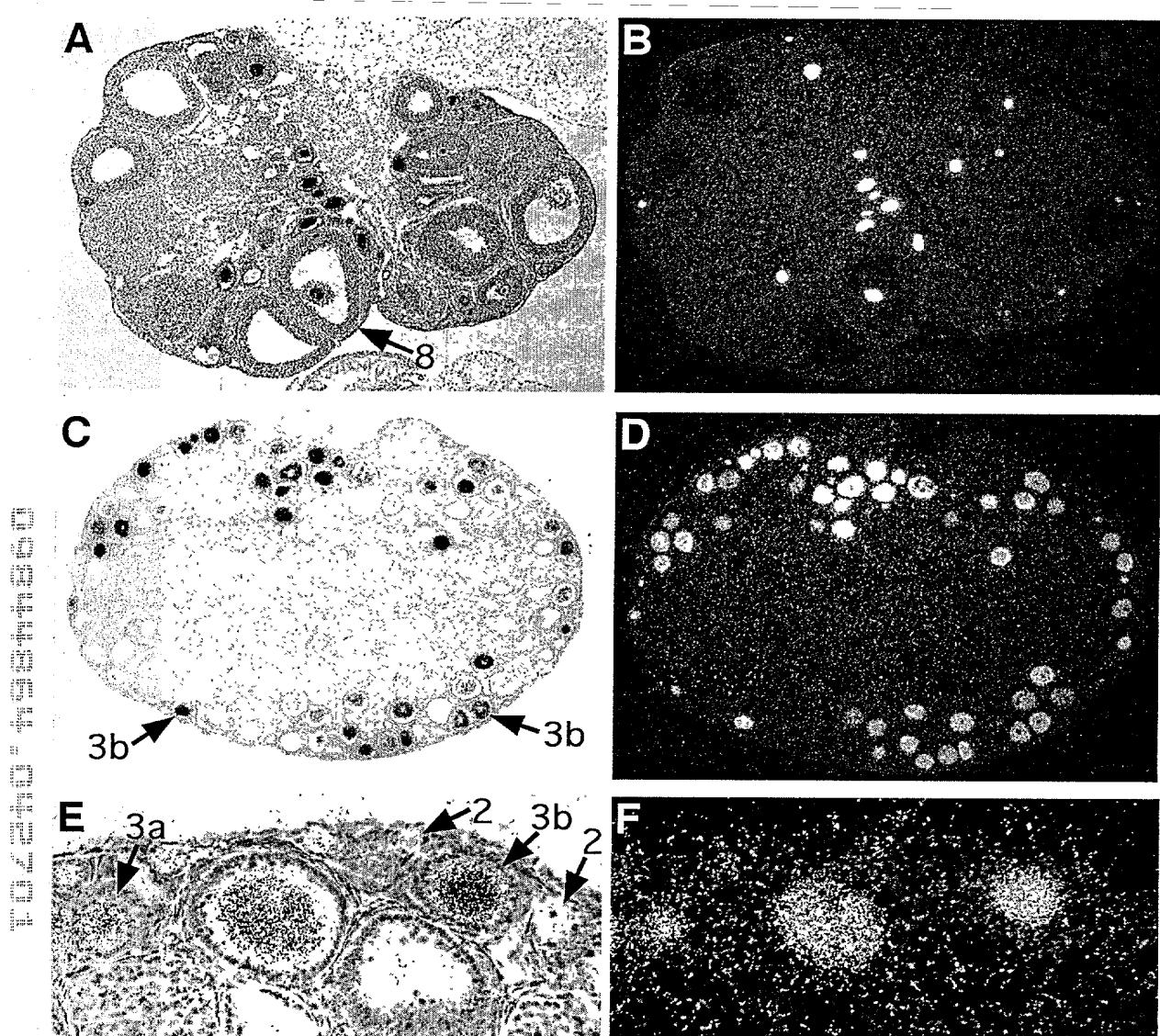


Figure 20

Oo1ps:

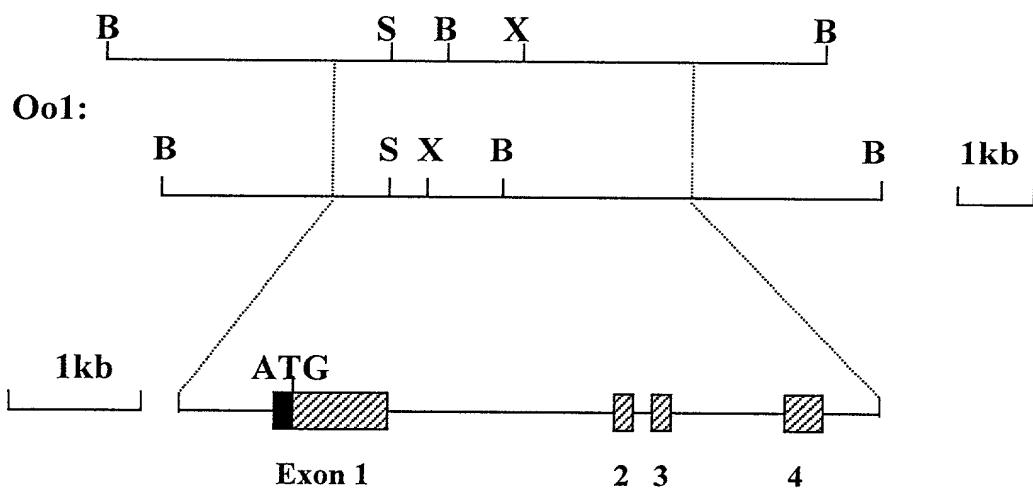


Figure 21

Oo1	gene	GGGGGGGGAGGGGGAGCGCACCCATGTTCCCGGGAGGCACGTTCCACCCCTGCCGCATCCTTATCCG	70
psOo1	gene	GGGGGGGGAGGGGGAGCGCACCCATGTTCCCGGGAGGCACGTTCCACCCCTGCCGCATCCTTATCCG	
Oo1	gene	CAGGCCACCAAAGCGGGGATGGCTGGAGGTTGGAGGCCAGGGCTGCCGACCGGCCCCCTCCCTCC	140
psOo1	gene	CAGGCCACCAAAGCGGGGATGGCTGGAGGTTGGAGGCCAGGGCTGCCGACCGGCCCCCTCCCTCC	
Oo1	gene	TCCCCGGCTACAGACAGCTCATGGCGOGGGAGTACGTCGACAGCCACCAGGGCACAGCTCATGGCCCT	210
psOo1	gene	TCCCCGGCTACAGACAGCTCATGGCGOGGGAGTACGTCGACAGCCACCAGGGCACAGCTCATGGCCCT	
Oo1	gene	GCTGTCGGGATGGGTCCCCGGTGGCTAGCAGCGCGTGAACGCTGCCGTCAGGTAACCGGCGGCGAC	280
psOo1	gene	GCTGTCGGGATGGGTCCCCGGTGGCTAGCAGCGCGTGAACGCTGCCGTCAGGTAACCGGCGGCGAC	
Oo1	gene	GCCTCGGTGCAGTGTCACTCGGGCGCGCACCGTGCAGCCTGCAGGGTGCAGGTAACCGGCGGCGAC	350
psOo1	gene	GCCTCGGTGCAGTGTCACTCGGGCGCGCACCGTGCAGCCTGCAGGGTGCAGGTAACCGGCGGCGAC	
Oo1	gene	GATCGGGTTCCTGTCAACCCCGTGGCCACGCCGGCGGGAGATCCCCGGGATCTGGCAGACCGTAGC	420
psOo1	gene	GGTCGGGTTCCTGTCAACCCCGTGGCCACGCCGGCGGGAGATCCCCGGGATCTGGCAGACCGTAGC	
Oo1	gene	CCCGTTCTCGTCGGTACCTTCCTGTCAGGCTCTCCCTCACTGGAGGTGCCGAGGCAGGACACCC	490
psOo1	gene	CCCGTTCTCGTCGGTACCTTCCTGTCAGGCTCTCCCTCACTGGAGGTGCCGAGGCAGGACACCC	
Oo1	gene	ACGAAGGGAGAGGGGAGCCCGGATCCCTGGGGACCCCGGAAACCGGAGCCAGAGAGGTGGGGAGGA	560
psOo1	gene	ACGAAGGGAGAGGGGAGCCCGGATCCCTGGGGACCCGGAAACCGGAGCCAGAGAGGTGGGGAGGA	
Oo1	gene	AAGGGTCCCCCAGCCGAAGCGAGGGGATGTTAGCTCAGGCTGCCAGGGAGGGGGTGGGAGCAGCA	630
psOo1	gene	AAGGGTCCCCCAGCCGAAGCGAGGGGACGTTAGCTCAGGCTGCCAGGGAGGGGGTGGGAGCAGCA	
Oo1	gene	GCCACCACCGGAGGACCGAACAGTGTGGGGGATGCACTGAGCTGCCAGGAGGGAGCCATGTCT	700
psOo1	gene	GCCACCACCGGAGGACCGAACAGTGTGGGGGATGCACTGAGCTGCCAGGAGGGAGCCATGTCT	
Oo1	gene	GCGCAGAGATGGCTCAGGACCCGGTGAATCGATGCCCTCGAGACCGCTCCCCCAAAGCACGG	770
psOo1	gene	GCGCAGAGATGGCTCAGGACCCGGTGAATCGATGCCCTC_____CCCCCAAAGCACGG	
Oo1	gene	AGCAGGACAAGGAGCCCTGGTTCCAGgtgaggccagcctg...intron 1 (1.8kb)...taccctgc	799
psOo1	gene	AGCAGGACAAGGAGCCCTGGTTCCAGgtgaggccagcctg...intron 1 (1.8kb)...taccctgc	
Oo1	gene	tgttcagTTCTTAGAGCAGAAGTACGGCTACTATCACTGCAAGGACTGCAAAATCCGGTGGGAGAGGGCT	863
psOo1	gene	tgttcagTTCTTAGAGCAGAAGTACGGCTACTATCACTGCAAGGACTGCAAAATCCGGTGGGAGAGGGCT	
Oo1	gene	ATGTGTGGTGTGTCAGGGCACCAGTAAGgtaaagagacaccgtg...intron 2 (78bp)...tctttctcct	892
psOo1	gene	ATGTGTGGTGTGTCAGGGCACCAGTAAGgtaaagagacaccgtg...intron 2 (78bp)...tctttctcct	
Oo1	gene	cgcaggGTGTACTTCAAACAGTTCTGCCGAGTGTGAGAAATCCTACAAACCCCTACAGAGTGGAGGACAT	957
psOo1	gene	cgttag GTGTACTTCAAACAGTTCTGCCGAGTGTGAGAAATCCTACAAACCCCTACAGAGTGGAGGACGT	
Oo1	gene	CACCTGTCAAgtaaaccaaacgttt...intron 3 (878bp)...actccgattttcagAGTGTAAAAGAACT	982
psOo1	gene	CACCTGTCAAgtaaaccaaacgttt...intron 3 (878bp)...gctctgattttcagAGTGTAAAAGAACT	

Figure 22a

Oo1	gene	AGATGTGCCCTGCCCACTCAGACCTCTGCCACGGGACCCCTAAACGCCCCCATGGCAAGACCTTGIGIGGGA	1052
psOo1	gene	AGATGTGCCCTGCCCACTCAGACCTCTGCCACGGTACCTAGACGCCCCCATGCAAGACCTTGIGIGGAA	
Oo1	gene	GATGCAAGGACAAAATGCTTGCTCTGCGACAGCACCTTCAGCTTCAAATACATCATTTAGTGAGAGTACGA	1122
psOo1	gene	GATGCAAGGACAAAACCGCTGCTCTGCGACAGCACCGTCAGCTTCAAATACATGATTAGTGAGAGTCGAA	
Oo1	gene	AACGTTCTGCTAGATGGGCTAATGGAATGGACAAGTGAGCTTCCTCCCCCTCTTCCCTCTTCCCATTTC	1192
psOo1	gene	AACGTTCTGCTAGATGGGCTAATGGAATGGACAAGTGAGCTTCCTCCCCCTCTTCCCTCTTCCCATTTC	
Oo1	gene	CAAATTCATGACAGACAGTGTACTTGGATATAAGCCCTGAAATAAAAGGTATTGCAAACA	1257
psOo1	gene	CAAATTCATGACAGACAGTGTACTTGGATATAAGCCCTGAAATAAAAGGTATTGCAAACA	

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Figure 22b

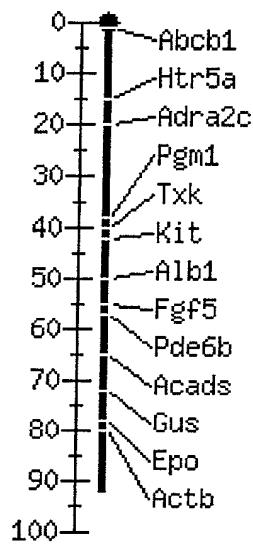
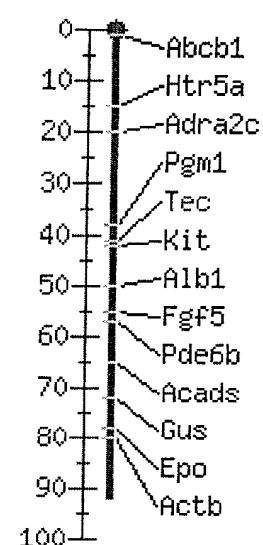
A**B**

Figure 23

Oo1 Gene Targeting Strategy

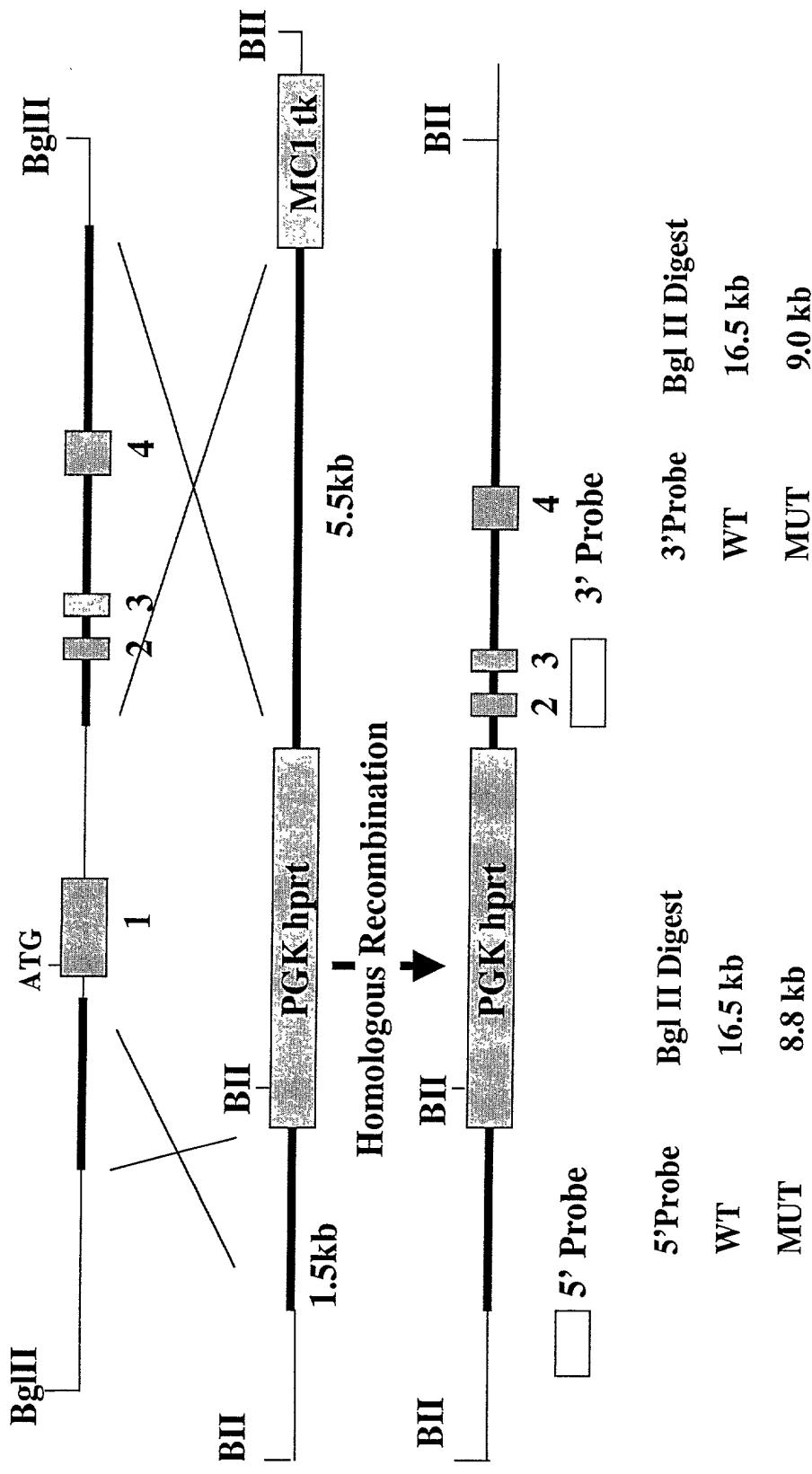


Figure 24

Human NPM2 cDNA sequence: 924bp

CAGCCCGCTT CTCTGCCCGG AGCCATGAAT CTCAGTAGCG
 CCAGTAGCAC GGAGGAAAAG GCAGTGACGA CCGTGCTCTG
 GGGCTGCGAG CTCAGTCAGG AGAGGCGGAC TTGGACCTTC
 AGACCCCAGC TGGAGGGGAA GCAGAGCTGC AGGCTGTTGC
 TTCATACGAT TTGCTTGGGG GAGAAAGCCA AAGAGGAGAT
 GCATCGCGTG GAGATCCTGC CCCCAGCAAA CCAGGAGGAC
 AAGAAGATGC AGCCGGTCAC CATTGCCTCA CTCCAGGCCT
 CAGTCCTCCC CATGGTCTCC ATGGTAGGAG TGCAGCTTTC
 TCCCCCAGTT ACTTTCCAGC TCCGGGCTGG CTCAGGACCC
 GTGTTCTCA GTGCCAGGA ACAGTTATGAA GCATCAGACC
 TAACCTGGGA GGAGGAGGAG GAAGAAGAAG GGGAGGAGGA
 GGAAGAGGAA GAGGAAGATG ATGAGGATGA GGATGCAGAT
 ATATCTCTGG AGGAGCAAAG CCCTGTCAAA CAAGTCAAAA
 GGCTGGTGCC CCAGAACAG GCGAGCGTGG CTAAGAAAAA
 AAAGCTGGAA AAAGAAGAAG AGGAAATAAG AGCCAGCGTT
 AGAGACAAGA GCCCTGTGAA AAAGGCCAAA GCCACAGCCA
 GAGCCAAGAA GCCAGGATTG AAGAAATGAG GAGCCACGCC
 TTGGGGGGCA CGGTGCAAAG TGGGCCTTCC CTGGGCTGTG
 CTGCAGGCAC AGGGTGCCTTCC TGTCAGCCC CTCCACCTGT
 GTCTGAATGC AACAGGGGTG TTGCAGGGGC AACATGAGAG
 CCCCTCACCC CCAACTCTCC ACTTTCAGGA GGCCCCAGT
 GAAGAGCCCC ACCTCGGGGT CACAATAAAAG TTGCCTGGTC
 AGGAAAAAAA AAAAAAAA AACGTTGCG GCCGCAAGCT
 TATG

Human NPM2 Amino Acid sequence: 214aa

MNLSSASSTE EKAVTTVLWG CELSQERRTW TFRPQLEGKQ
 SCRLLLHTIC LGEKAKEEMH RVEILPPANQ EDKKMQPVTI
 ASLQASVLPV VSMVGVQLSP PVTFQLRAGS GPVFLSGQER
 YEASDLTWEE EEEEEGEEEE EEEEDDEDED ADISLEEQSP
 VKQVKRLVPQ KQASVAKKKK LEKEEEEIRA SVRDKSPVKK
 AKATARAKKP GFKK

Figure 25